

## CLAIMS

1. A method of operating a radio communication system having a downlink channel for transmissions by a primary station to one or more secondary stations and an uplink random access channel for transmissions from the or each secondary station to the primary station, the method comprising the secondary station transmitting an uplink signal on the random access channel giving an indication of the radio channel characteristics, and the primary station transmitting a signal on the downlink channel at a power level and/or bit rate which takes into account the indicated radio channel characteristics.
2. A method of operating a radio communication system having a downlink channel for transmissions by a primary station to one or more secondary stations and an uplink random access channel for transmissions from the or each secondary station to the primary station, the method comprising the secondary station transmitting an uplink signal on the random access channel, which uplink signal can be used by the primary station to determine the prevailing radio channel characteristics of the random access channel, the primary station in response to determining the radio channel characteristics transmitting a signal on the downlink channel at a power level and/or bit rate which takes into account the determined radio channel characteristics.
3. A method as claimed in claim 1 or 2, characterised in that the primary station transmits a signal including an indication of the transmitted power level, and in that a secondary station receiving said signal measures the received signal strength and determines the channel characteristic of the downlink and transmits a signal including an indication of the channel characteristic on the random access channel.

4. A method as claimed in claim 1 or 2, characterised in that the primary station transmits a signal including an indication of the transmitted power level, and in that a secondary station receiving said signal measures the received signal strength and transmits a signal including an indication of the received signal strength on the random access channel.

5. A method as claimed in claim 1 or 2, characterised in that a secondary station retransmits an access preamble signal at successively increasing power levels until an acknowledgement signal is received from the primary station, the secondary station in response to the receipt of the acknowledgement signal transmitting a message containing an indication which can be used by the primary station to determine the prevailing radio channel characteristic from the particular retransmission of the access preamble signal acknowledged.

6. A method as claimed in claim 1 or 2, characterised in that a secondary station retransmits an access preamble signal at successively increasing power levels until an acknowledgement signal is received from the primary station, each transmission of the access preamble signal including an indication of its power, and in that the primary station stores an indication of the lowest transmission power of the access preamble signal and can determine the channel characteristic by obtaining the difference between the lowest transmission power and the power of the access preamble signal received and acknowledged.

7. A method as claimed in claim 1 or 2, characterised in that the channel characteristic comprises the radio attenuation characteristic.

8. A method as claimed in claim 1 or 2, characterised in that a secondary station determines the signal to interference ratio (SIR) of a signal transmitted by the primary station and includes an indication of the determined SIR in a signal transmitted on the random access channel.

9. A method as claimed in claim 1 or 2, characterised in that the uplink signal comprises a message part of the random access channel signal.

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10. A method as claimed in claim 1 or 2, characterised in that the random access channel includes the transmission of access preambles by the secondary station, in that the access preambles are encoded with a selected one of a plurality of signatures, and in that the selected signature is chosen according to a quantity to be signalled.

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11. A method as claimed in claim 1 or 2, characterised in that the random access channel comprises a plurality of access sub-channels, and in that an access sub-channel is selected by a secondary station for the transmission of an access preamble in accordance with a quantity to be signalled.

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12. A method as claimed in claim 1 or 2, characterised in that the random access channel is a CDMA channel and in that the transmission of an access preamble is offset in time by a number of chip periods corresponding to a quantity to be signalled.

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13. A radio communication system comprising a primary station having transceiving means for transmitting signals on a downlink channel and at least one secondary station having transceiving means for transmitting uplink signals to the primary station on a random access channel, the secondary station having means for determining the prevailing radio channel characteristics of the random access channel and for transmitting these characteristics to the primary station, the primary station having means responsive to the receipt of the radio channel characteristics for determining the power level and/or bit rate of a downlink signal in dependence on the radio channel characteristics.

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14. A system as claimed in claim 13, characterised in that the or each secondary station has encoding means for transmitting access preamble signals as CDMA signals and in that said encoding means includes signal  
5 offsetting means for offsetting in time an access preamble signal by a number of chip periods corresponding to the radio channel characteristics.

15. A secondary station comprising transceiving means for receiving downlink signals from a primary station and for transmitting uplink signals on a  
10 random access channel and means for determining the prevailing radio channel characteristics of the random access channel and for transmitting these characteristics to the primary station.

16. A secondary station as claimed in claim 15, characterised in that  
15 the secondary station further includes encoding means for transmitting access preamble signals as CDMA signals and in that said encoding means includes signal offsetting means for offsetting in time an access preamble signal by a number of chip periods corresponding to the radio channel characteristics.

20 17. A primary station comprising transceiving means for transmitting signals on a downlink channel to at least one secondary station and for receiving uplink random access channel signals including indicia useable for determining the prevailing radio channel characteristics of the random access channel, and means responsive to the indicia for determining the power level  
25 and/or bit rate to transmit downlink signals to the at least one secondary station.

18. A primary station as claimed in claim 17, wherein the uplink signals comprise CDMA access preamble signals and the indicia comprises a  
30 timing offset of the access preamble signal relative to a reference time, characterised in that the primary station comprises means for determining the

timing offset and for adjusting the transmit power level in accordance with the timing offset.

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